

Method of Producing a Fire-Retardant Veneer

As well as Fire-Retardant Veneer

The invention relates to a method of producing a fire-retardant veneer or the like material or material composite according to the preamble of claim 1.

A further subject matter of the invention is a veneer produced according to the method of claim 1. An object of the invention is the production of a veneer or the like material which is flame-resistant.

In a material composite, various core materials may be provided. In all instances, preferably there are no additions of salts or other commercially available fire-retarding substances.

A further object of the invention is to provide a simple and economic method of producing thin sheets of veneer having improved properties as compared to known veneers, which veneer sheets may be used for the most varying applications both in aviation and also in other sensitive fields. These may be public facilities, ships, yachts, trains or other facilities requiring fire protection.

US 4 247 332 A does describe a method of producing

fire-retardant veneers, yet it describes the impregnation of a surface dried by the influence of heat with a water-soluble, fire-retardant agent.

DE 198 44 431 A1 describes the impregnation of a cork barrier layer, which, however, cannot be termed a veneer as defined by the present invention.

The object mentioned above is obtained by the measures according to the characterizing part of claim 1.

The veneer thus obtained may be subjected to a further treatment or finishing process. Thus, it is, e.g., possible to pickle the veneer and/or to treat it with lacquers, preferably with clear lacquers. With special lacquer systems, also a high-gloss surface can be produced.

The process of veneer finishing is effected under the influence of heat and pressure (0.5 - 7 bar) over a period of time of between 10 and 120 min. It is important that by a longer influence of heat, it becomes possible for the water in the pores of the veneer to escape and, thus, for the resin (depending on the requirements, phenol or epoxy resin) to get into the pores of the wood.

The heat (depending on the resin system and duration used, between 125° and 155°C) is applied over the veneer. In presses, this may be effected via heated press plates, in autoclaves or in kilns via the surface of the respective tools. In case of autoclaves and kilns, the use of vacuum tools is necessary.

By substituting the water by resin, on the one hand, the negative properties of swelling and shrinking are reduced in the hydrophobic material wood, which has a positive effect on the dimensional stability, and, on the other hand, the burning behavior of the thin veneer sheet is considerably improved by a fire-resistant resin system.

The resin is introduced into the veneer by capillary action. By supplying energy in the form of heat, water bound in the pores of the veneer is caused to evaporate. The water vapor which escaping from the veneer subsequently draws the liquid resin into the pores of the veneer. In a press, pressure equalization is effected by vapor flowing out via the edges of the composite, in the autoclave and kiln via the vacuum line and/or by a thermal treatment of another type. This process may be accelerated by using perforated release

papers.

Release papers, release foils or the like may also be used as a substrate to prevent the escape of resin by sucking in or pressing in after the vapor has escaped.

After curing of the resin, the veneer treated in this manner can be further processed like any other veneer.

In this finishing process, a veneer sheet assembled to the desired size (0.7 mm) is pressed together with a film of resin. The duration of compression, the temperature as well as the pressure will be different depending on the resin system used and types of wood employed. To produce material composites in the above-described process, also a core material can be co-compressed. By using a resin film, a homogeneous distribution of the resin over the entire surface of the veneer is ensured.

After having been treated with lacquers, the composite thus formed may be used for high-quality real-wood veneer furniture, i.a. in aviation. Moreover, the composite may be used in all other fields which are sensitive in terms of fire protection engineering. Be-

cause the properties of the veneer have been altered, also its swelling and shrinking behavior is significantly reduced.

Thus, by combining a resin that is already present in the impregnation of fiber fabric with various core materials, such as, e.g., honeycomb cores, light-weight and decorative composites can be produced which will also meet the high requirements of aviation.

Further characteristic features of the invention will be explained in more detail by way of the drawings in which two exemplary embodiments have been illustrated in simplified form for the method steps for producing a refined veneer.

Therein,

Fig. 1 shows the production of a veneer; and

Fig. 2 shows that of a composite.

According to Fig. 1, a veneer sheet 1 assembled to the desired dimension is laid onto a film of resin 2, below which a layer of a separating material, e.g. a release paper 3, is provided. After having covered the veneer sheet 1 with a further layer of a separating material, e.g. of a release paper 3', the veneer sheet 1 is compressed in the heating press. Depending on the

method, resin system and temperature employed, this process may last for between 10 and 120 min (e.g. 10 min at 155°C "hot in - hot out" method and Stesalith resin system at a pressure of 2 bar). The veneer thus obtained may be subjected to any type of refining treatment.

According to the exemplary embodiment of Fig. 2, two veneer sheets 1 according to Fig. 1 assembled to the desired dimension are assembled with an intermediate layer 4 of a core material having, e.g., the form of a honeycomb body with any honeycomb sections desired, e.g. in the form of a light-weight construction core. The light-weight construction core may consist of a corrugated material with plane material sheets of impregnated material arranged therebetween. The honeycomb material may be wood or metal, e.g. sheet-metal. As the resin film 2, a resin-impregnated fiber material (Prepreg) and/or similar material may be used. As the core material 4, also the material known by the trade-name Nomex may be used. The composite body thus obtained is compressed in a heating press. Depending on the method, resin system and temperature used, this process may last for between 10 and 120 min (e.g.

10 min at 155°C "hot in - hot out" method and Stesalith resin system at a pressure of 1 bar).

Within the scope of the invention, of course, also more than two veneers according to Fig. 1 may be assembled to a composite body with a respective intermediate layer of a core material.